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FROM: GARY P. OAKESON

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OUR DOCKET NO.: 200315570-1

FOR: PIGMENTED INK-JET INKS WITH IMPROVED PRINT QUALITY AND
RELIABILITY

SUBJECT: APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

Attached please find an Appeal Brief under 37 C.F.R. § 41.37 for Docket No.
200315570-1, Application No. 10/807,025.

Thank you. We await your confirmation of receipt.

Respectfully submitted,

Gary P. Oakeson
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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. 200315570-1IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Zia Ur Rehman

Confirmation No.: 2239

Application No.: 10/807,025

Examiner: Edward J. Cain

Filing Date: 03/22/2004

Group Art Unit: 1796

Title: Pigmented Ink-Jet Inks With Improved Print Quality and Reliability

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450TRANSMITTAL OF APPEAL BRIEFTransmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on May 2, 2008.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☒ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:☒ 1st Month
\$120☐ 2nd Month
\$450☐ 3rd Month
\$1020☐ 4th Month
\$1590☐ The extension fee has already been filed in this application.☐ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.Please charge to Deposit Account 08-2025 the sum of \$ 620. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.☒ A duplicate copy of this transmittal letter is enclosed.☐ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:
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Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANT:	Zia Ur Rehman	CERTIFICATE OF DEPOSIT UNDER 37 C.F.R. § 1.8 I hereby certify that this correspondence is being transmitted via facsimile to the USPTO or being deposited with the United States Postal Service with sufficient postage as first class postage in an envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below. <u>5/12/08</u> Date of Deposit <u>Brenda Wiseman</u> Brenda Wiseman
SERIAL NO.:	10/807,025	
FILING DATE:	3/22/2004	
CONF. NO.:	2239	
FOR:	PIGMENTED INK-JET INKS WITH IMPROVED PRINT QUALITY AND RELIABILITY	
ART UNIT:	1796	
EXAMINER:	Edward J. Cain	
DOCKET NO.:	200315570-1	

APPELLANTS' APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Mail Stop Appeal Brief - Patents

Sir:

Appellants submit this Appeal Brief in connection with their appeal from the final rejection of the Patent Office, mailed January 15, 2008, in the above-identified application. A Notice of Appeal was filed on May 2, 2008, which was received by the Board of Appeals on May 2, 2008.

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I. REAL PARTY IN INTEREST

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

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II. RELATED APPEALS AND INTERFERENCES

Appellants and Appellants' legal representatives know of no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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III. STATUS OF CLAIMS

Claims 1-6, 8-9, 11-19, 21-26, and 28-29 remain pending and have been rejected.

Claims 7, 10, 20, 27, and 30 have been canceled. The claims on appeal in this application are claims 1-6, 8-9, 11-19, 21-26, and 28-29.

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IV. STATUS OF AMENDMENTS

An amendment to claims 1, 11, and 21 was submitted by Appellants on March 14, 2008 after the Final Office Action mailed on January 15, 2008. The amendment was entered by the Examiner.

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V. SUMMARY OF CLAIMED SUBJECT MATTER

1. A system for printing images on a substrate, comprising (page 3, lines 6-7; page 6, lines 12-13):

a) an ink-jet ink including (page 3, lines 7-8; page 6, line 13):

- i) a liquid vehicle including water, and from 5 wt% to 35 wt% total organic solvent content (page 3, lines 10-11; page 6, lines 16-17), wherein the organic solvent content includes at least three of 1,5-pentanediol, ethoxylated glycerol, 2-pyrrolidinone, and 2-methyl-1,3-propanediol (page 16, lines 7-9; page 18, Table 1);
- ii) from 0.1 wt% to 6 wt% of acid-functionalized pigment solids (page 3, lines 8-9; page 6, lines 14-15);
- iii) from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer (page 3, lines 9-10; page 6, lines 15-16), said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw (page 3, lines 11-13; page 6, lines 17-19).

b) a printhead loaded with the ink-jet ink (page 3, line 7; page 6, lines 13-14) and configured for jetting the ink-jet ink at a firing frequency from 12 kHz to 25 kHz (page 7, lines 27-29), and wherein the frequency response range for the ink-jet ink is such that the ink-jet ink is jettable at from 3 kHz to 25 kHz (page 7, line 30 – page 8, line 1).

11. A method of rapidly printing an ink-jet image (page 3, line 14; page 6, line 20), comprising ink-jetting an ink-jet ink onto a media substrate at a firing frequency

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from 12 kHz to 25 kHz (page 3, lines 15-16; page 6, lines 21-22), said ink-jet ink comprising (page 3, line 16; page 6, line 22):

- a) a liquid vehicle including water, and from 5 wt% to 35 wt% total organic solvent content (page 3, lines 18-19; page 6, lines 24-25), wherein the organic solvent content includes at least three of 1,5-pentanediol, ethoxylated glycerol, 2-pyrrolidinone, and 2-methyl-1,3-propanediol (page 16, lines 7-9; page 18, Table 1);
- b) from 0.01 wt% to 6 wt% of acid-functionalized pigment solids (page 3, lines 16-17; page 6, lines 22-23);
- c) from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer (page 3, lines 17-18; page 6, lines 23-24), said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw (page 3, lines 19-21; page 6, lines 25-27),

wherein the frequency response range for the ink-jet ink is such that the ink-jet ink is jettable at from 3 kHz to 25 kHz (page 7, line 30 – page 8, line 1).

21. An ink-jet ink composition, comprising (page 3, line 22; page 6, line 28):

- a) a liquid vehicle having from 5 wt% to 35 wt% of total organic solvent content (page 3, lines 24-26; page 6, line 31 – page 7, line 1), wherein the organic solvent content includes at least three of 1,2-pentanediol, ethoxylated glycerol, 2-pyrrolidinone, and 2-methyl-1,3-propanediol (page 16, lines 7-9; page 18, Table 1);
- b) from 0.1 wt% to 6 wt% of acid-functionalized pigment solids (page 3, line 23; page 6, line 29);

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- c) from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer
(page 3, lines 23-24; page 6, lines 29-30), said styrene-maleic
anhydride copolymer having a weight average molecular weight from
about 400 Mw to 15,000 Mw (page 3, lines 26-27; page 7, lines 1-2);

wherein the ink-jet ink composition is reliably jettable at all firing frequencies ranging
from 3 kHz to 25 kHz (page 7, line 30 – page 8, line 1).

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VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented for review are:

- a. whether claims 21-26 and 28-29 are unpatentable under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2005/0027035 (hereinafter "Wang") in view of evidence given in U.S. Patent No. 5,571,311 (hereinafter "Belmont");
- b. whether claims 1-3, 6, 8, 11-13, and 16-18 are unpatentable under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,214,100 (hereinafter "Parazak") in view of U.S. Patent No. 5,889,083 (hereinafter "Zhu") and U.S. Patent No. 6,874,881 (hereinafter "Suzuki");
- c. whether claims 4-5 and 14-15 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Parazak in view of Zhu and Suzuki, and further in view of U.S. Patent No. 6,280,513 (hereinafter "Osumi");
- d. whether claims 9 and 19 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Parazak in view of Zhu and Suzuki, and further in view of U.S. Patent Publication No. 2002/0198287 (hereinafter "Ohta");
- e. whether claims 21-23, 26, and 28 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Parazak in view of Zhu;
- f. whether claims 24-25 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Parazak in view of Zhu, and further in view of Osumi;
- g. whether claim 29 is unpatentable under 35 U.S.C. § 103(a) as being obvious over Parazak in view of Zhu, and further in view of Ohta;
- h. whether claims 1-3, 6, 8, 11-13, and 16-17 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Parazak in view of Zhu, and U.S. Patent No. 6,652,055 (hereinafter "Oikawa");

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- i. whether claims 4-5 and 14-15 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Parazak in view of Zhu and Oikawa and further in view of Osumi;
and
- j. whether claims 9 and 19 are unpatentable under 35 U.S.C. § 103(a) as being obvious Parazak in view of Zhu and Oikawa, and further in view of Ohta.

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VII. ARGUMENT

A. Appellants' invention

Appellants' claimed invention provides compositions, methods, and systems directed at an ink-jet ink composition, comprising a liquid vehicle having from 5 wt% to 35 wt% of total organic solvent content, wherein the organic solvent content includes at least three of 1,2-pentanediol, ethoxylated glycerol, 2-pyrrolidinone, and 2-methyl-1,3-propanediol; from 0.1 wt% to 6 wt% of acid-functionalized pigment solids; from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer, said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw; such that the ink-jet ink composition is reliably jettable at all firing frequencies ranging from 3 kHz to 25 kHz.

B. The Asserted References

1. The Wang Reference and the Belmont Reference

Wang discloses the use of styrene-maleic anhydride to control black-to-color bleed in ink-jet ink. See Abstract. Wang describes the use of self-dispersed pigments including "those described in U.S. Pat. No. 5,571,311 by Belmont et al" See [0027]. Belmont teaches self-dispersed pigments through the attachment of ionic groups on the pigment surface. However, such an ionic group "may be an anionic group or a cationic group and the ionizable group may form an anion or a cation." See col. 5, lines 8-10.

2. The Parazak Reference

Parazak discloses an ink-jet ink directed to ester modified macromolecular chromophores. See col. 2, lines 22-32. As noted by the Examiner, Parazak can use a

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combination of solvents including ethoxylated glycerol, 2-pyrrolidinone, and 1, 5-pentanediol. See col. 5, lines 36-38.

3. The Zhu Reference

Zhu discloses an ink-jet ink suitable for printing on non-traditional substrates such as "glass, plastic, and metal" that are "scratch and rub resistant." See col. 1, lines 4-9. Zhu further states that "there exists a need for aqueous jet ink compositions that can meet the low VOC regulations." Zhu accomplishes this objective by using an ink composition comprising water, a colorant, a binder resin, and a wax. See col. 2, lines 39-40. Zhu states that the binder resin is a "film former," see col. 4, lines 48-51; having a preferable concentration of 5% to 10% by weight. See col. 6, lines 31-43. Zhu further states that the "organic solvent is preferably used in small amounts" to accomplish the low VOC purposes; teaching a concentration below 20%, preferably 0.1% to about 10%, and more preferably about 1% to about 5%. See col. 8, lines 66-67; col. 9, lines 1-6. As noted by the Examiner, Zhu discloses the use of a styrene-maleic anhydride resin. See col. 5, lines 57-67.

4. The Suzuki Reference

Suzuki discloses an ink-jet ink suitable for high speed printing comprising water, a water soluble coloring material, a resinous dispersant, glycerin, ethylene urea, and polyoxyethylene alkyl ether. See col. 3, lines 6-17. It is worthy to note, that the glycerin and ethylene urea "are critically important components" to maintain an ink capable of such printing. See col. 5, lines 64-67. While the ink is directed to certain printing frequencies, Suzuki specifically states that the ink can achieve 5 kHz or 10 kHz but has an "upper limit" of "about 15 kHz in practice." See col. 10, lines 32-44.

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C. Rejections Under 35 U.S.C. § 102(c)

1. Requirements for Prima Facie Anticipation

The Examiner has rejected claims 21-26 and 28-29 under § 102(c) as being anticipated by Wang in view of evidence given in Belmont.

In order to establish a *prima facie* case of anticipation, the Examiner must show that each and every element is present in a single prior art reference. Specifically, the Appellants wish to briefly state what is required to sustain such a rejection according to the current case law. It is well settled that "[a] claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987). In order to establish anticipation under 35 U.S.C. 102, all elements of the claim must be found in a single reference. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986), *cert. denied* 107 S.Ct. 1606 (1987). In particular, as pointed out by the court in *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1981), *cert denied*, 469 U.S. 851 (1984), "anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference," "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.* 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

With the above background in mind, Appellants contend that the Examiner has not met this burden with respect to any of the claims on appeal. Particularly, Appellants submit that the PTO has failed to show that each and every element of the claimed invention is contained in the Ohbayashi reference. Appellants now turn to a discussion of the specific rejection at issue.

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2. Rejections to Claims 21-26 and 28-29

The Examiner has rejected claims 21-26 and 28-29 under § 102(c) as being anticipated Wang in view of evidence in Belmont. However, Appellants contend that the present references do not teach each and every element of these claims.

As previously argued, Wang discloses the use of styrene-maleic anhydride to control black-to-color bleed in ink-jet ink. However, the Examiner is attempting to reject the aforementioned claims by Wang under a 102 standard even though Wang does not teach each and every element of the independent claim 21. Specifically, Wang does not teach an acid-functionalized pigment or being reliably jettable at all firing frequencies ranging from 3 kHz to 25 kHz.

Appellants note that Wang explicitly discloses "self-dispersed pigments" and not necessarily acid-functionalized pigments as presently claimed. In reference to this teaching, the Examiner has stated that "Wang et al. points to Belmont et al." in an attempt to show the acid functionalized pigment. See Office Action mailed July 25, 2007, page 3. However, Appellants note that Wang never incorporates Belmont by reference. As such, Appellants submit that the Examiner would have to at least combine Wang with Belmont in order to establish a proper combination of elements from each reference. To be clear, Appellants submit that the element of an acid functionalized pigment is missing from Wang and that the Examiner could only establish this element through a combination of references, since Belmont is not incorporated by reference nor does Wang refer to any specific pigment from Belmont that is acid functionalized, which would serve as evidence. As such, Appellants note that such a combination could not establish a 102 anticipatory rejection but could only qualify as a 103 obviousness rejection. Appellants also stated for the Examiner's information that the Wang reference and the present invention are commonly owned

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and that the present invention was filed before the publication date of Wang, so Wang is not available for use in a rejection under § 103(a). MPEP 706.02(I)(1). In other words, it appears that the Examiner is maintaining an otherwise § 103 rejection as a § 102 rejection because Wang qualifies as prior art under § 103(c), which essentially means that Wang cannot be used to sustain an obviousness rejection under 103(a).

Even if Wang could be viewed as incorporating the material from Belmont, Wang still does not teach the element of an acid-functionalized pigment. Wang merely suggests the use of "self-dispersed pigments" and not necessarily acid-functionalized pigments as presently claimed. As such, incorporating the material from Belmont would not teach "the identical invention ... in as complete detail" as presently claimed, as required by *Richardson v. Suzuki Motor Co.* Specifically, Belmont teaches self-dispersed pigments through the attachment of ionic groups on the pigment surface. However, such an ionic group "may be an anionic group or a cationic group and the ionizable group may form an anion or a cation." See col. 5, lines 8-10. As such, Wang does not specifically teach an acid-functionalized pigment in its inks even if one were to consider the teachings of Belmont. Therefore, Wang does not teach the identical invention in as complete detail as required to establish a proper 102 rejection. Further, at a best, this is a situation where a genus teaching is used to reject a species claim (i.e. self-dispersed pigment could be considered a genus of the specific species of an acid-functionalized pigment).

Appellants note that the Examiner has presently addressed this argument in the Advisory Action dated April 9, 2008. Specifically, the Examiner directs Appellants' attention to "column 3, lines 55-65" of Wang. See page 2. However, Appellants note that Wang is a U.S. Patent Publication and does not contain columns or line numbers; rather pages and paragraph numbers (as commonly associated with U.S. Patent

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Publications). As such, Appellants cannot determine the passage to which the Examiner is referring. Appellants have searched PAIR for alternative formats of Wang in order to ascertain to the specific passage to which the Examiner has referred, but have been unable to locate any such alternate formatting. Additionally, Appellants have reviewed Wang and reassert that Wang does not teach acid-functionalized pigments; only self-dispersed pigments generally. Furthermore, Appellants note that the Examiner has not issued a 102(e) rejection by Wang alone, but has maintained the present rejection of Wang as evidenced by Belmont. Such a rejection, by its very heading, requires Belmont and should be a combination rejection because of the clearly missing elements in Wang (not merely as a result of needed clarifying points, but rather the requirement of additional elements from Belmont).

Furthermore, there is no disclosure in Wang directed to jetability of inks as related to print head firing frequency. The ink to which independent claim 21 and its dependent claims are directed is reliably jettable at all firing frequencies from 3 kHz to 25 kHz. This characteristic is a limitation of the claims in addition to the listed ink component elements. Therefore, to anticipate these claims, a prior art reference must teach the firing frequency limitation as well.

The Examiner has apparently treated this characteristic as merely an intended result, rather than as an actual limitation. Those having skill in the art can appreciate that reliable jetting across such a wide range of frequencies is not a common characteristic in ink-jet inks. Consequently, one skilled in the art will also recognize that not every formulation based on a combination of components will exhibit the same frequency response. Given a particular combination, one skilled in the art may create a number of formulations having a given frequency response profile, where the response profile is achievable by adjusting relative proportions of the components

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based upon their individual properties. Similarly, the same approach can be used to arrive at a number of formulations having very different characteristics from the first set. Therefore, for a claim reciting a list of components, ranges of amounts, and frequency response characteristic(s), some combinations of amounts of components will yield inks upon which the frequency response recitation will read, while other combinations will not. In light of this, Appellants have recited the claim element of reliably jettable at all firing frequencies ranging from 3 kHz to 25 kHz, and have clearly exemplified how to accomplish this. In other words, the Applicant submits that an ink, falling within the generally component parameters as set forth in the present independent claims but that could not be reliably jetted at all firing frequencies ranging from 3 kHz to 25 kHz, would not be covered by the claim. As such, the frequency response characteristic is a limitation on the scope of the claim that alerts one skilled in the art as to the specific formulations that are encompassed by the claim.

It follows that a disclosure that teaches the components without also explicitly teaching the frequency response characteristic cannot be said to be definitively disclosing that characteristic. At most, there is a mere possibility that the frequency characteristic is present in the disclosed formulations. However, the Federal Circuit has clearly stated that inherency cannot be established by possibilities or probabilities. See, e.g., In re Robertson, 169 F.3d 743, 745 (Fed Cir. 1999). Here, the Wang reference does not teach that the inks disclosed therein are reliably jettable at firing frequencies from 3 kHz to 25 kHz as required by the present claims.

Appellants therefore submit that Wang does not anticipate claim 21 because it fails to disclose every element of the claim. Consequently, Wang also does not anticipate the claims depending from claim 21, in that they each include all of the

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limitations of claim 21. As such, Appellants respectfully request that the Board overturn the present rejection.

D. Rejections Under 35 U.S.C. § 103(a)

1. Requirements for Prima Facie obviousness

The Examiner has rejected claims 1-6, 8-9, 11-19, 21-26, and 28-29 under § 103(a) as being *prima facie* obvious over a number of references; each rejection using at least Parazak as a primary reference in view of Zhu. The Patent and Trademark Office (PTO), through the Examiner, has the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1998). To satisfy this burden, the PTO must meet the criteria set out in M.P.E.P. § 706.02(j):

[T]hree basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Voeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Moreover, the obviousness analysis must comply with the statutory scheme as explained by the Supreme Court in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), namely, consideration must be given to: (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed invention, (3) the level of ordinary skill in the pertinent art, and (4) additional evidence, which may serve as indicia of non-obviousness.

An excellent summary of how the prior art must be considered to make a case of *prima facie* obviousness is contained in *In re Ehrreich et al.*, 220 U.S.P.Q. 504, 509-511 (CCPA 1979). There the court states that a reference must not be considered

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in a vacuum, but against the background of the other references of record. It is stated that the question of a § 103 case is what the reference(s) would "collectively suggest" to one of ordinary skill in the art. However, the court specifically cautioned that the Examiner must consider the entirety of the disclosure made by the reference and avoid combining them indiscriminately.

In finding that the "subject matter as a whole" would not have been obvious in *Ehrreich* the court concluded:

"Thus, we are directed to no combination of prior art references which would have rendered the claimed subject matter as a whole obvious to one of ordinary skill in the art at the time the invention was made. The PTO has not shown the existence of all the claimed limitations in the prior art or any suggestion leading to their combination in the manner claimed by applicants." (underlining added)

It has been widely recognized that virtually every invention is a combination of elements and that most, if not all, of these will be found somewhere in an examination of the prior art. This reasoning lead the court, in *Connell v. Sears, Roebuck & Co.*, 220 U.S.P.Q. 193, 199 (Fed. Cir. 1983) to state:

"...it is common to find elements or features somewhere in the prior art. Moreover, most if not all elements perform their ordained and expected function. The test is whether the claimed invention as a whole, in light of all the teachings of the references in their entireties, would have been obvious to one of ordinary skill in the art at the time the invention was made." (underlining added)

With the above background in mind, Appellants contend that the Examiner has not met this burden with respect to any of the claims on appeal. Particularly, Appellants submit that the PTO has failed to show that each and every element of the claimed invention is contained in the combined references. Appellants now turn to a

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discussion of the individual rejections at issue, and the references on which they are based.

2. The Rejection of Claims 1-6, 8-9, and 11-19

According to M.P.E.P. § 706.02(j), to render a claim *prima facie* obvious, the asserted prior art reference (or references when combined) must teach or suggest all of the claim limitations. Appellants submit that none of the combinations asserted by the Examiner teach or suggest each and every element of claims 1-6, 8-9, and 11-19.

Each of the independent claims recite that the ink is capable of printing at a frequency along the entire spectrum ranging from 3 kHz to 25 kHz. In rejecting independent claims 1 and 11, the Examiner has used two distinct combinations: Parazak, Zhu and Suzuki; and Parazak, Zhu, and Oikawa. As such, these combinations are discussed below.

The Examiner alleges that the combination of Parazak and Zhu teach all the elements of claims 1 and 11 except for a printhead configured for a specific firing frequency and drop volume. However, the present combination of Parazak and Zhu is improper. Specifically, one skilled in the art would be discouraged from combining Parazak with Zhu since Zhu teaches away from the use of organic solvents as found in Parazak. Even though the Examiner has previously acknowledged that since Zhu "limits the use of solvent to 20%," the Examiner contends that unless such use renders the primary reference inoperable, Zhu cannot be said to teach away from Parazak.

See Office Action dated July 25, 2007; page 15-16; citing MPJP 2145 III.

However, Appellants contend that such a statement is not in accordance with the current case law regarding "teaching away." This being said, Appellants submit that such a combination could render the primary reference inoperable based on the

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teachings of the references as a whole, as Zhu teaches away from the ink composition of Parazak. As Appellants have raised the issue of teaching away and disagreed with the Examiner's interpretation of the doctrine, Appellants would like to review the current case law regarding teaching away for the Board's convenience.

The Court of Appeals for the Federal Circuit has clearly stated that "an applicant may rebut a prima facie case of obviousness by showing that the prior art teaches away from the claimed invention in any material respect." In re Petersen, 315 F.3d 1325, 1331 (Fed. Cir. 2003). The Court has also stated that "[w]e have noted elsewhere, as a 'useful general rule,' that references that teach away cannot serve to create a prima facie case of obviousness." (emphasis added) McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1354 (Fed. Cir. 2001). In identifying the appropriate standard for teaching away, the Court has further stated:

The mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency.] In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981) (citations omitted). "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown." In re Spormann, 53 C.C.P.A. 1375, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966). Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection. See In re Newell, 891 F.2d 899, 901, 13 USPQ2d 1248, 1250 (Fed. Cir. 1989).

Clearly in the present case, a person of ordinary skill in the art would be discouraged from following the path set forth in Parazak which teaches the use of up to 50 wt% of organic solvents including low-boiling solvents such as "primary aliphatic alcohols of 30 carbons or less," see col. 4, lines 1-2, based on the teachings of Zhu, since Zhu explicitly states that solvents should be used in small amounts, preferably 1- 5 wt%, see col. 9, lines 4-6, and preferably have "high boiling points," see col. 8, lines 47-48.

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Furthermore, the Applicant submits that a person skilled in the art, after reviewing each reference in its entirety would be discouraged from combining the elements of the respective compositions since the references set out clearly divergent paths in achieving their ink compositions, as evidenced by the difference in the amounts of organic solvents and types of organic solvents used (as pointed out by the Examiner "the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art" see Office Action dated July 25, 2007; page 15, quoting *In re Keller*). As such, the Applicant submits that Zhu teaches away from Parazak since the references set out clearly divergent paths in achieving their ink compositions, and therefore, such a combination cannot be used to establish a *prima facie* case of obviousness.

Additionally, the Examiner has cited the Suzuki reference to provide the requisite teaching of high-frequency printing. However, as noted above, Suzuki specifically teaches that the high speed printing frequency has an upper limit of about 15 kHz. As such, the combination would have no likelihood of success in producing the system, method, or ink of the present invention. The Examiner has responded that Suzuki states that the drive frequency is "not limited" and that the frequency has been increased to 10 kHz or higher. The Examiner has also asserted that, in light of this statement, it would be obvious to one of ordinary skill in the art to utilize a printer with firing frequency up to 25 kHz. Appellants would point out, however, that obviousness rejections must be based on findings of how a person of ordinary skill would have understood prior art teachings. Appellants submit that the teaching of

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Suzuki, taken as a whole, states an upper limit of about 15 kHz and therefore serves to discourage one skilled in the art from utilizing a printer having a higher speed.

Further, and perhaps most importantly, Appellants submit that Parazak, Zhu, and Suzuki do not teach or disclose an ink that reliably prints across a large range of frequencies, i.e. 3 kHz to 25 kHz, as discussed in the 102 section of the present appeal. Specifically, Appellants submit that an ink, falling within the generally component parameters as set forth in the present independent claims but that could not be reliably jetted at all firing frequencies ranging from 3 kHz to 25 kHz, would not be covered by the claim. As such, the frequency response characteristic is a limitation on the scope of the claim that alerts one skilled in the art as to the specific formulations that are encompassed by the claim.

However, instead of treating the firing frequency as a claim element, the Examiner has repeatedly alleged that such a frequency is inherent to the composition. If such a viewpoint was adopted, the firing frequency as recited in the independent claims would have absolutely no meaning. Notably, the Examiner has not argued that every ink within the disclosed parameters would be ink-jettable over the disclosed firing frequencies; rather the Examiner contends that absent evidence to the contrary the ink would inherently be ink-jettable over the disclosed range. However, such an inherency argument cannot support a proper 103 rejection.

For the Board's convenience, Appellants wish to provide the current case law regarding the use of inherency in establishing a proper 103 rejection. In In re Rijckaert, the Court concluded that even though the Board had found that a certain condition was known to be optimal, the Court concluded that the condition was not necessarily inherent and overturned the 103 rejections based on such inherency. 9

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F.3d 1531, 1533-34 (Fed. Cir. 1993). Specifically, the Court provided several inherency standards applicable to obviousness, including:

"[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency.]" In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981) (citations omitted). "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown." In re Spornmann, 53 C.C.P.A. 1375, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966). Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection. See In re Newell, 891 F.2d 899, 901, 13 USPQ2d 1248, 1250 (Fed. Cir. 1989).

As applied to the present case, the mere fact that the combination of Parazak and Zhu contains materials that may provide an ink that is ink-jettable over a firing frequency of 3 kHz to 25 kHz, such disclosure is not enough to establish inherency. Additionally, even if the present combination may be inherent from Parazak and Zhu's description, the present combination of materials that are "reliably jettable at all firing frequencies ranging from 3 kHz to 25 kHz" was not known, nor has the Examiner made such an allegation. As such, Appellants submit that the Examiner has not established the recited firing frequencies through inherency. Therefore, Appellants submit that the present pending claims contain an element that has not been disclosed or taught in the cited art. As such, Appellants respectfully request that the Board overturn the present rejection.

In another set of rejections of independent claims 1 and 11, the Examiner has cited Oikawa to provide a teaching of a high-frequency print head. While Oikawa does refer to increasing heater driving frequency to several tens of kHz, the language cited simply refers to a general trend in meeting demand for faster printing without indicating the feasibility of any given frequency range. In fact, the reference goes on to discuss the limitations encountered when increasing frequency, e.g. the growing

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conflict between control pulse width and firing period eventually lead to ejection failure. See col. 3, lines 7-11. In any event, Oikawa does not remedy the deficiency of Parazak and Zhu with regard to teaching an ink that is reliably jettable at all firing frequencies from 3 kHz to 25 kHz.

As Parazak and Zhu combined with either of Oikawa or Suzuki fail to provide each and every element of independent claims 1 and 11, Appellants submit that a *prima facie* case of obviousness against these claims is not supported. Furthermore, the other references cited against the claims depending from these do not remedy the deficiency of Parazak, Zhu, Oikawa, and Suzuki. As such, Appellants respectfully request that the Board overturn the present rejections.

Additionally, Appellants note that the Examiner has now stated that Appellants' arguments regarding the presently recited frequency range as not being inherent to the ink composition "raises issues of enablement" See Advisory Action dated April 9, 2008, page 2. First, Appellants submit that the present arguments regarding inherency have been presented throughout prosecution of the present application. As such, the Examiner had ample opportunity to make such a rejection, but did not. This being alleged at the last minute by the Examiner, the Board should note that the Appellant's application contains an exemplified composition that achieves the present frequency range. As such, Appellants submit that the present invention is enabled as required by the enablement standards.

3. The Rejection of Claims 21-26 and 28-29

According to M.P.E.P. § 706.02(j), to render a claim *prima facie* obvious, the asserted prior art reference (or references when combined) must teach or suggest all of the claim limitations. Appellants submit that the present combination asserted by

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the Examiner does not teach or suggest each and every element of the rejected claims.

The Examiner has used the combination of Parazak and Zhu to reject claims 21-26 and 28-29, asserting again that the combination provides an ink that is intrinsically reliably jettable at all firing frequencies from 3 kHz to 25 kHz. The Applicants reiterate their positions discussed above with regard to the teaching away arguments and the firing frequency characteristic as an actual limitation of the claims, and incorporate those arguments here by reference. Each limitation must be disclosed in the prior art references to support a case for obviousness. Neither Parazak nor Zhu teach the frequency characteristic required by the present claims. Furthermore, such a teaching is not inherent or intrinsic to either of these disclosures. As such combining them does not yield the present invention, nor is the combination itself obvious to do so. As the combination of Parazak and Zhu does not provide each and every element of the pending claim set, Appellants respectfully request the Board to overturn the current rejections.

B. Conclusion

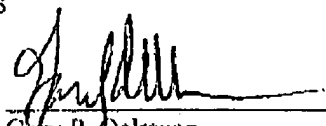
Appellants respectfully submit that the claims on appeal set forth in the Appendix are patentably distinct from the asserted prior art references. Particularly, none of the asserted combinations of references would teach one of ordinary skill in the art within the meaning of 35 U.S.C. § 102(c) or 35 U.S.C. § 103(a) to arrive at the presently claimed invention. Appellants contend that none of the cited references, alone or in combination, teach each and every element of the claimed invention, and that a *prima facie* case of anticipation or obviousness has not been established.

For at least these reasons, Appellants respectfully request that the Board of Appeals reverse the rejections and remand the case to the Examiner for allowance.

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Dated this 12th day of May, 2008


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VIII. CLAIMS APPENDIX

1. (previously presented) A system for printing images on a substrate, comprising:

a) an ink-jet ink including:

- iv) a liquid vehicle including water, and from 5 wt% to 35 wt% total organic solvent content, wherein the organic solvent content includes at least three of 1,5-pentanediol, ethoxylated glycerol, 2-pyrrolidinone, and 2-methyl-1,3-propanediol;
- v) from 0.1 wt% to 6 wt% of acid-functionalized pigment solids;
- vi) from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer, said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw.

b) a printhead loaded with the ink-jet ink and configured for jetting the ink-jet ink at a firing frequency from 12 kHz to 25 kHz, and wherein the frequency response range for the ink-jet ink is such that the ink-jet ink is jettable at from 3 kHz to 25 kHz.

2. (original) The system of claim 1, wherein the acid-functionalized pigment solids have an average size from about 5 nm to about 10 μ m.

3. (original) The system of claim 1, wherein the ink-jet ink further comprises from 0.001 wt% to 0.3 wt% surfactant.

4. (original) The system of claim 1, wherein the ink-jet ink further comprises from 0.05 wt% to 4 wt% of a salt selected from the group consisting of ammonium salt, sodium salt, potassium salt, and lithium salt.

5. (original) The system of claim 4, wherein the ammonium salt is ammonium benzoate.

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6. (original) The system of claim 1, wherein an acid precursor used to form the acid-functionalized pigment is selected from the group consisting of para-aminobenzoic acids, isophthalic acids, triacids, and combinations thereof.

7. (canceled).

8. (original) The system of claim 1, wherein the printhead is configured for jetting the ink-jet ink at a drop volume from about 10 pL to 20 pL.

9. (previously presented) The system of claim 1, wherein the ink-jet ink further comprises a trishydroxymethylaminomethane buffer.

10. (canceled).

11. (previously presented) A method of rapidly printing an ink-jet image, comprising ink-jetting an ink-jet ink onto a media substrate at a firing frequency from 12 kHz to 25 kHz, said ink-jet ink comprising:

- d) a liquid vehicle including water, and from 5 wt% to 35 wt% total organic solvent content, wherein the organic solvent content includes at least three of 1,5-pentanediol, ethoxylated glycerol, 2-pyrrolidinone, and 2-methyl-1,3-propanediol;
- e) from 0.01 wt% to 6 wt% of acid-functionalized pigment solids;
- f) from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer, said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw,

wherein the frequency response range for the ink-jet ink is such that the ink-jet ink is jettable at from 3 kHz to 25 kHz.

12. (original) The method of claim 11, wherein the acid-functionalized pigment solids have an average size from about 5 nm to about 10 μ m.

13. (original) The method of claim 11, wherein the ink-jet ink further comprises from 0.001 wt% to 0.3 wt% surfactant.

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14. (original) The method of claim 11, wherein the ink-jet ink further comprises from 0.05 wt% to 4 wt% of an ammonium salt.

15. (original) The method of claim 14, wherein the ammonium salt is ammonium benzoate.

16. (original) The method of claim 11, wherein an acid precursor used to form the acid-functionalized pigment is selected from the group consisting of para-aminobenzoic acids, isophthalic acids, triacids, and combinations thereof.

17. (original) The method of claim 11, wherein the firing frequency is from 15 kHz to 25 kHz.

18. (original) The method of claim 11, wherein ink-jetting step is at a drop volume from about 10 pL to 20 pL.

19 (previously presented) The method of claim 11, wherein the ink-jet ink further includes a tris(hydroxymethyl)aminomethane buffer.

20. (canceled).

21. (previously presented) An ink-jet ink composition, comprising:

- d) a liquid vehicle having from 5 wt% to 35 wt% of total organic solvent content, wherein the organic solvent content includes at least three of 1,2-pentanediol, ethoxylated glycerol, 2-pyrrolidinone, and 2-methyl-1,3-propanediol;
- e) from 0.1 wt% to 6 wt% of acid-functionalized pigment solids;
- f) from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer, said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw;

wherein the ink-jet ink composition is reliably jettable at all firing frequencies ranging from 3 kHz to 25 kHz.

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22. (original) The ink-jet ink composition of claim 21, wherein the acid-functionalized pigment solids have an average size from about 5 nm to about 10 μ m.

23. (original) The ink-jet ink composition of claim 21, wherein the ink-jet ink further comprises from 0.001 wt% to 0.3 wt% surfactant.

24. (original) The ink-jet ink composition of claim 21, wherein the ink-jet ink further comprises from 0.05 wt% to 4 wt% of an ammonium salt.

25. (original) The ink-jet composition of claim 24, wherein the ammonium salt is ammonium benzoate.

26. (original) The ink-jet ink composition of claim 21, wherein an acid precursor used to form the acid-functionalized pigment is selected from the group consisting of para-aminobenzoic acids, isophthalic acids, triacids, and combinations thereof.

27. (canceled).

28. (original) The ink-jet ink composition of claim 21, wherein the ink-jet ink composition is reliably jettable at a drop volume from about 10 pL to 20 pL.

29. (previously presented) The ink jet ink composition of claim 21, wherein the ink-jet ink further includes a trishydroxymethylaminomethane buffer.

30. (canceled).

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IX. EVIDENCE APPENDIX

(No matter presented)

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X. RELATED PROCEEDINGS APPENDIX

(No matter presented)